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DOE, RFFO

COMPARISON OF THE DECONTAMINATION AND DECOMMISSIONING POTENTIAL OF BUILDINGS 886 AND 779 - TRD-035-94

Action: None Required

As you are aware, the Environmental Restoration Program Division (ERPD) Decontamination and Decommissioning (D&D) Program has been planning the D&D of a major facility at Rocky Flats. Two facilities have been identified as likely candidates. These are Buildings 886 and 779. In both cases, several ancillary facilities could also be included in the project scope. Each of these facilities have pros and cons as D&D projects; however, one major criteria for the selection of a facility is that it be in a D&D ready state by Fiscal Year (FY)1996.

From available information it is surmised that of these two facilities, Building 886 would have the highest probability that it can be available for D&D by FY 1996. This conclusion is based on the information provided in the attached comparison of Building 886 versus Building 779.

Should you have any questions, please contact me at extension 8760, Anthony Tome at extension 4072, or Tom Bourgeois at extension 8711.

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TGB:cw

Orig. and 1 cc - V. F. Witherill

**Attachment:
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3 PARTIAL'OPEN

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22:00
1500



ADMIN RECORD
IA-A-00017

BUILDING 886 vs 779 D&D ANALYSIS

BUILDING 886 COMPLEX

Facility Description

The Building 886 complex is comprised of five facilities, Building 886, T886A, Building 880, Building 828, and Building 875. The complex is located in the northeast quadrant of the 800 Area complex. The five facilities are totally enclosed within their own security perimeter and access is through the east portal of Guard Post 888.

Building 886 is the former Critical Mass Laboratory. It houses four Category B reactors as classified by DOE Order 5480.6. These were reactivity addition devices used to perform criticality experiments. Building 886 is constructed of reinforced concrete and back filled cinder block with rebar reinforcement. Rooms 101 and 102 are constructed of reinforced concrete walls and ceilings. The roof is sheet metal with tar overlay.

Building 886 consists of a Radiological Controlled Area (RCA) and office area. There is approximately 5,360 square feet of office area in the building and additional office space in an attached trailer. Trailer T886A is prefabricated and is attached to Building 886 by breezeway. The RCA is approximately 5,000 square feet in area and consists of three rooms (Rooms 101, 102, and 103). A layout of Building 886 is depicted in Figure 1-1.

Room 101 is the assembly room where all criticality experiments were performed. Located in the room are three of the four Category B reactors (the fourth one was deactivated with minimal equipment remaining). It is anticipated that potential contamination exists below the floor due to the floating floor design. Room 101 is known to have heavy enriched uranium contamination. The contamination is expected to be less than 20 dpm/100 cm². Two enclosures, the walk-in hood and the experimental tank, within Room 101 are highly contaminated.

Room 102 is known as the Fissile Material Storage Room or Vault. Drums of low-level radioactive waste are currently stored in the room as well as bulk uranium oxide cubes. An area inside the room has radiation levels of 7.2 mR/hr from Californium check sources.

Room 103 is the mixing room where solutions of uranyl nitrate is stored in nine storage tanks. There is a total of 2,700 liters of Highly Enriched Uranium Nitrate (HEUN) stored inside of the tanks. The room contains a glovebox and a separate HEPA filtered HVAC which exhausts to the main filter plenum. This room contains both plutonium and uranium contamination.

solution. The projected turn-a-round for the process is approximately 1 year once funding becomes available.

In December of 1993, an Alternate Use Evaluation Report was completed which evaluated the potential viability of using space in Building 886 for any one of four waste management functions. These were Potential Laboratory Space and Equipment; Potential Technology Development Space; Potential Waste Support Equipment; and Potential Waste Storage Space. The conclusion was that Building 886 was not suitable for any of these activities.

From a D&D perspective, the Building 886 Complex offers a good spectrum of decontamination problems due to the materials used in the building. The facility was built in the 1960s and contains asbestos. Due the lack of good documentation of the facility and history, an exhaustive sampling program would need to be developed and implemented prior to D&D, as outline in the D&D Program Management Plan.

On a severity scale, Building 886 would be less complex than the pure plutonium buildings inside of the PA. Waste generation from the building is estimated at 139 metric tons of low-level waste, 300 metric tons of low-level mixed waste, and 1185 metric tons of sanitary waste. The 300 metric tons of low-level mixed waste cannot be disposed of at an off site facility and would have to be treated to remove the hazardous constituents or characteristics or stored on site.

The D&D cost for the Building 886 complex is estimated to be 14.8 million dollars. This cost was extracted from the Rocky Flats Plant Environmental Restoration Management Subproject Baseline Non-Plutonium Buildings 1.4.7.1.2.2. The physical construction could begin as early as 1996, assuming that the HEUN is removed on a priority basis.

BUILDING 779 COMPLEX

DESCRIPTION OF FACILITIES

The building 779 complex is comprised of six facilities, Building 779 (including Buildings 779-2 and 779-3 which were major additions to Building 779), Building 727 (emergency generator), Building 729 (filter plenum and emergency generator), Building 780 (paint storage), Building 782 (filter plenum), and Building 783 (cooling tower). The complex is located west of Building 777 in the Protected Area (PA) of the plant. It is accessed through one of the three security portals which provide access to the PA. The complex is a nuclear facility used for Research and Development (R&D) in support of production and recovery processes.

Building 779 was originally constructed in 1965. Since then, two

300 gloveboxes which, in turn, contain mixed residues, Pu solutions, Pu oxides, Pu buttons, hazardous chemicals and classified tooling. The residues, solutions, oxides, and Pu are all being worked under separate programs.

In addition to radiological concerns and material, Building 779 has over twenty RCRA units.

Building 727 houses an emergency generator (500 KW) for emergency power for Building 782. The structure is approximately 16 feet wide by 24 feet long and 12 feet high. The walls are concrete block and support a reinforced concrete roof slab with asphalt-gravel roofing. The floor is also reinforced concrete. This facility is not expected to have contamination concerns.

Building 729 is a filter plenum facility for Building 779. It is connected by penthouse that serves as a connection for the exhaust duct bridge from Building 779. The building is 72 feet long by 38 feet wide and 16 1/2 feet high. The roof penthouse is 22 feet long by 10 feet wide and 7 feet 4 inches high. The building houses two filter plenums for room and glovebox air, from Building 779-3, and an emergency generator for critical equipment in Building 779. There are also two pits constructed to collect fire deluge water from the filter plenums in the event of a fire. The building construction consists of a reinforced concrete floor, double concrete block walls (one 4 in. thick and the other 6 inches thick with perlite in between), and precast concrete twin tee roof topped with 4 inches of concrete, 2 inches of foam-in-place urethane, and silicone rubber roofing. The roof is supported by cast-in-place concrete beams resting on reinforced concrete columns.

Building 782 serves as the plenum facility for the original Building 779 and 779-2 expansion. It houses three exhaust plenums for Building 779/779-2 and 782, glovebox, and hood exhausts, and also supplies air to itself via a plenum. The building is 100 feet long by 61 feet 8 inches wide and 15 feet 9 inches high. The floor construction is of reinforced concrete 6 to 9 inches thick. There is a pit which contains a fire water deluge collection tank. The exterior walls are precast, reinforced concrete panels (6 in. thick), keyed in place by 8 inch concrete columns. The roof is constructed of precast, reinforced concrete twin tees with a minimum of 2 inches of composite cast-in-place, stone aggregate topping supported by 8 inch reinforced concrete beams resting on reinforced concrete columns.

Building 782 is connected to Building 779 by a duct tunnel. The tunnel is 10 feet 8 inches by 12 feet and spans 48 feet. The walls, roof, and floor are constructed of 12 inch thick concrete. A layout of Building 782 is shown in Figure 2-4.

Building 780 is a paint storage facility. It has an area of 140 square feet. It is corrugated sheet metal with a reinforced

concrete slab floor and sheet metal roof. It was used to store paints and solvents and could generate hazardous waste.

STATUS OF FACILITIES

Building 779 currently houses approximately 110 people. Approximately fifty percent of the personnel are involved in direct support of maintaining the building Vital Safety System (VSS) and Limiting Conditions for Operations (LCO) surveillances, RCRA inspections, maintenance etc. The remainder of the building personnel are comprised of support groups to the building and site such as radiation protection and D&D Technology.

Operations in Building 779 were curtailed in November of 1989, however, the building conducts limited operations as dictated by site support requirements. There are over 2,000 chemicals stored in Radiological Control Areas. It is likely that many of these will have to be treated as RCRA regulated substances. Building 779 is also a building that has one of the highest quantities of asbestos in it.

There are 7 RCRA-permitted and 3 90-day storage areas located in Building 779. There are fourteen glovebox lines in the building, some of which house classified tooling which require dispositioning.

Special Nuclear Material (SNM), in the form of Pu buttons and solutions and level 0 SNM reside in Building 779. Mixed residues are stored in containers in the building. There are four major programs for liquid solution stabilization, mixed residues, thermal stabilization, HSP 31.11, and SNM consolidation, all of which encompass each of the plutonium buildings. Each of these programs could have a major impact on the scheduling and completion of a D&D project.

From a waste standpoint, it is estimated that D&D efforts will generate 52 metric tons of TRU waste, 4.4 metric tons of TRU-mixed waste, 2,700 metric tons of low-level waste, 480 metric tons of low-level mixed waste and 9,000 metric tons of sanitary waste. To deal with such a volume of waste, it will be essential to have substantial decontamination capability.

The Alternate Use Evaluation Report of December, 1993, evaluated Building 779 for the same four missions in support of Waste Management as for Building 886. The conclusion was that there was one room of 2,000 square feet with the potential to be used as laboratory space and 47 rooms of approximately 16,400 square feet with the potential to be used as technology development space. There was no potential waste support equipment or waste storage space.

Interviews with the Building Manager for Building 779 indicated the

following:

- There are several programs which have been identified and are in progress which will be implemented requiring building operation.
- The SNM movement from the building is tied to multiple plant programs (i.e. solution stabilization, SNM consolidation, etc.).
- Building 779 still has a purpose and continues to demonstrate its viability as an essential building.

If the decision was made to begin SNM movement now, it is estimated that the moves to Buildings 371, 771, and Los Alamos would take 2 to 5 years based on current plant issues.

The programs that are currently approved for building use include:

	<u>PROGRAM NAME</u>	<u>DURATION</u>	<u>ROOM</u>
-	Repack, Residue Feasibility Study (possible residue processing)	2 yrs +	160
-	Soil Analysis, Waste Feasibility Studies	2 yrs +	139
-	Met. Lab. & Analytical, Salt- Crete Analysis	1 yr	140 141A 141B 141C 234 228
-	Drum Head Gas Analysis	6 mo	234
-	Polymer Solidification	1 yr	270

The programs that are under evaluation are as follows:

	<u>PROGRAM NAME</u>	<u>DURATION</u>	<u>ROOM</u>
-	Compatibility Studies	2 yrs +	222
-	Hot Analytical	Extended	217

From a planning stand point, the earliest that the facility would be ready for D&D in entirety would be three years. Multiple rooms inside of the facility have been identified for strip out. One such room is currently a funded D&D Pilot Project. From a

realistic stand point, the facility would not be available for complete D&D for five years. This is based on implementation of current programs as well as issues surrounding material consolidation and removal from the building.

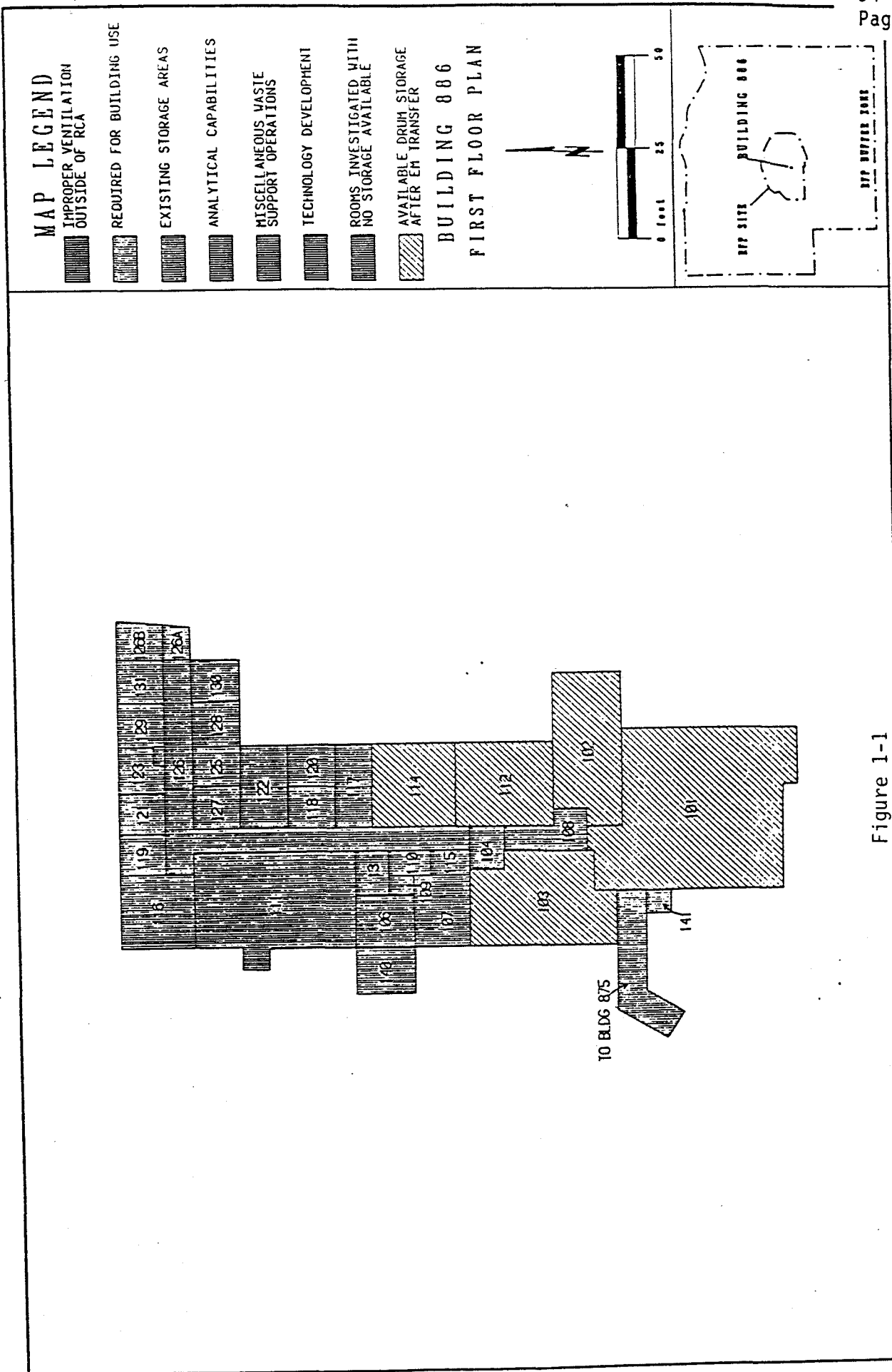
The D&D cost for the Building 779 complex is estimated to be 147.5 million dollars. This estimate was extracted directly from the Rocky Flats Plant Environmental Restoration Management Subproject Baseline Plutonium Buildings 1.4.7.1.2.1. The physical construction could begin as early as 1996, for the individual rooms, and then 1999 for the remainder of the building assuming that the programs and material removal is completed in 5 years.

SUMMARY

As described in the above analysis, Building 779 is more a complex D&D effort than Building 886 by one order of magnitude. This is reflected in the cost estimate for D&D of each complex (\$147.5MM vs \$14.8MM).

The availability of the Building 886 complex is controlled by the plant program for HEUN removal which could enable D&D efforts in 1996. HEUN funding has not been identified.

Building 779 has several programs associated with its current operation, four SNM disposition programs and potential alternate uses such as waste storage. Optimistically, the building could be ready for D&D in 1999. It is likely that the available rooms will be deactivated and ready for D&D prior to this time.



MAP LEGEND

IMPROPER VENTILATION
OUTSIDE OF RCA

REQUIRED FOR BUILDING USE

EXISTING STORAGE AREAS

ANALYTICAL CAPABILITIES

MISCELLANEOUS WASTE
SUPPORT OPERATIONS

TECHNOLOGY DEVELOPMENT

ROOMS INVESTIGATED WITH
NO STORAGE AVAILABLE

AVAILABLE DRUM STORAGE
AFTER EM TRANSFER

BUILDING 779
FIRST FLOOR PLAN

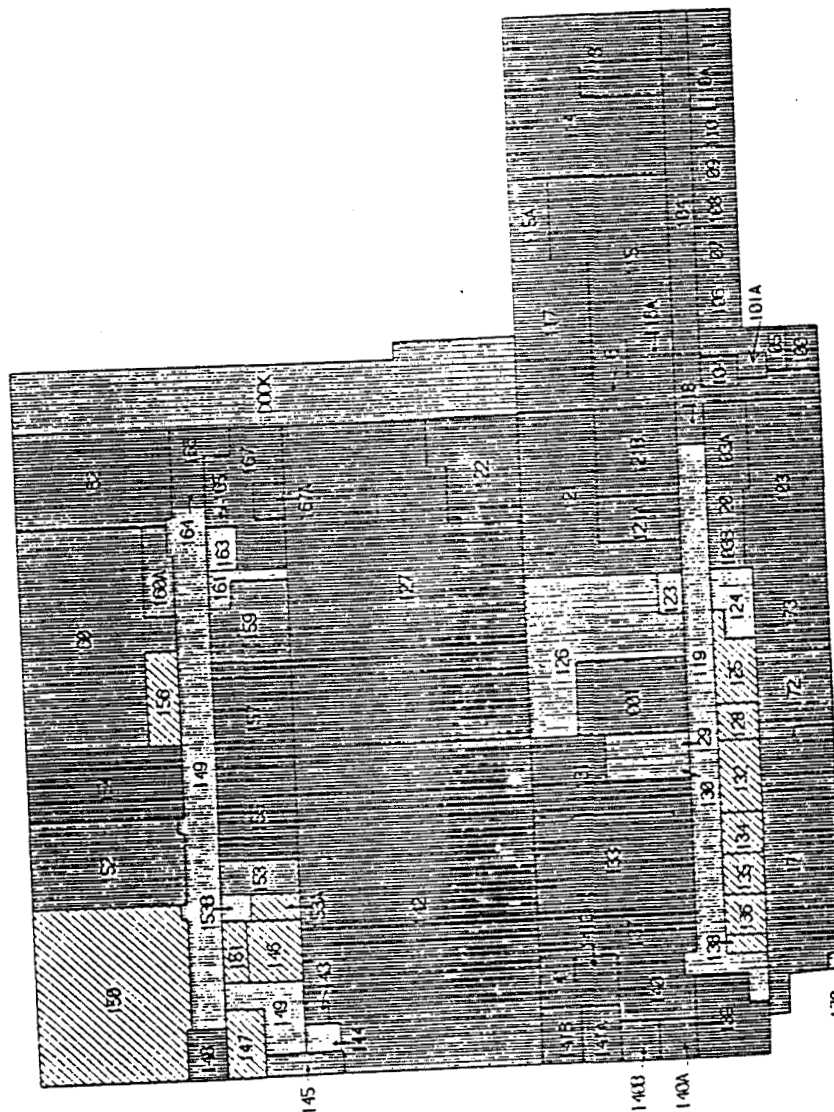
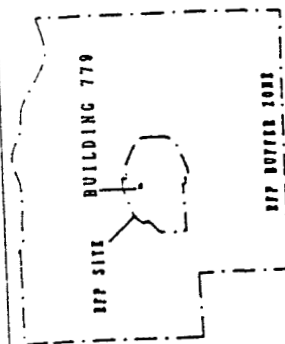


Figure 2-1

REQUIRED FOR BUILDING USE

EXISTING STORAGE AREAS

ANALYTICAL CAPABILITIES

MISCELLANEOUS WASTE
SUPPORT OPERATIONS

TECHNOLOGY DEVELOPMENT

ROOMS INVESTIGATED WITH
NO STORAGE AVAILABLE

AVAILABLE DRUM STORAGE
AFTER EM TRANSFER

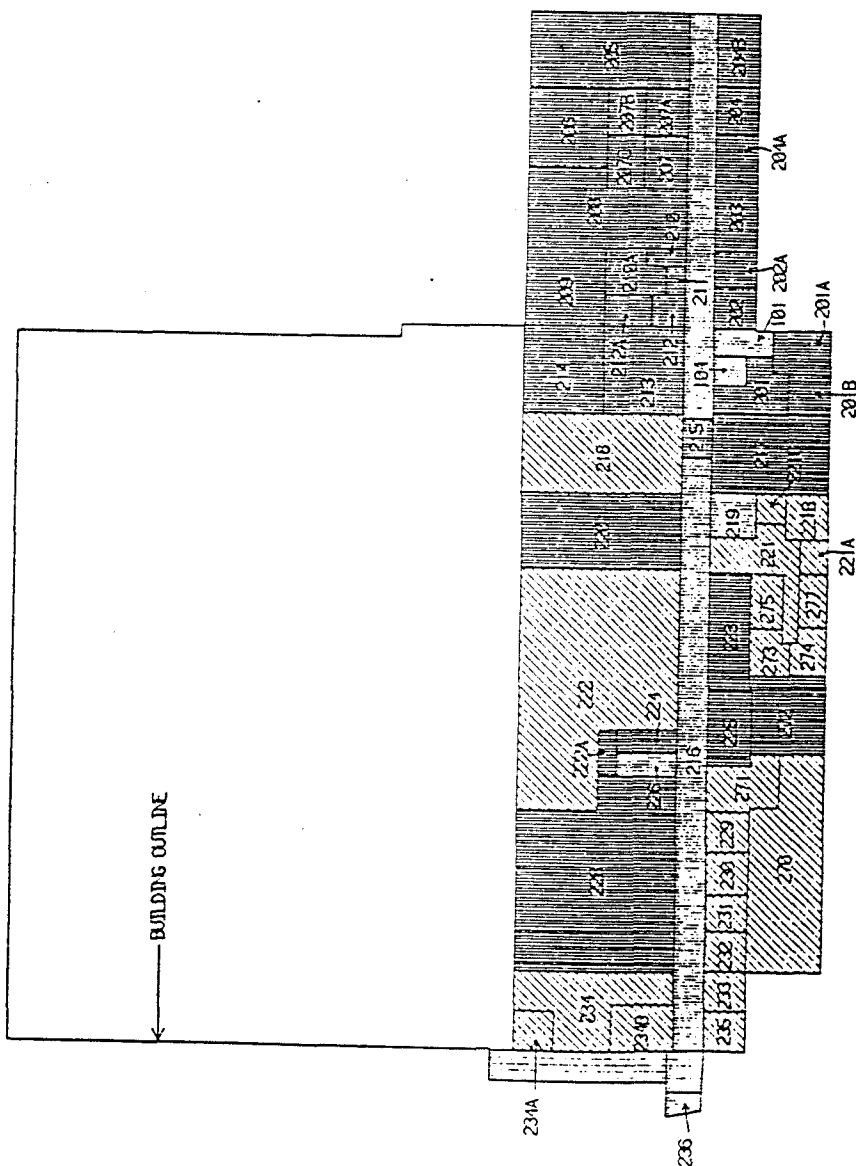
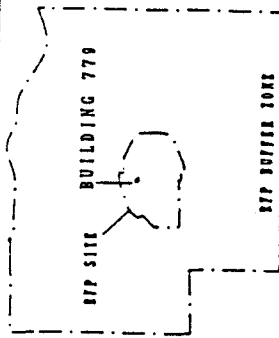
BUILDING 779
SECOND FLOOR PLAN

Figure 2-2